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EFFECTS OF ALTERNATIVE ECONOMIC SCENARIOS
AND COMMODITY POLICIES ON REGIONAL REPRESENTATIVE FARMS

by

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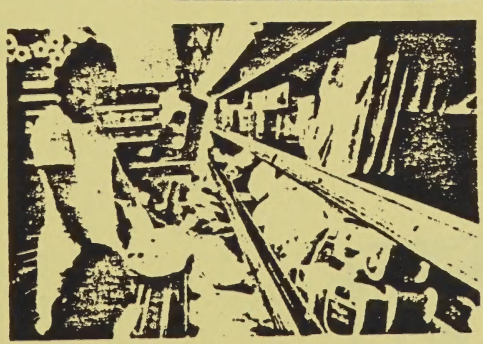

UNITED
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Abstract

Several southeast and other regional representative farm situations were simulated from 1980 to 1986 to show likely effects of alternative agricultural policy and economic environments on the micro-economic wellbeing of the farm sector. The results indicated that farms with a higher initital degree of asset ownership and percent equity had greater survivability, net cash income, and ability to maintain or increase net worth. Macroeconomic policy, (i.e., control of inflation) increases the performance of farms for these same variables. Suspension of direct commodity programs would severely reduce net cash incomes and abilities to maintain net worths, but survivability would still remain high.

KEYWORDS: Representative farms, policy analysis, commodity programs, inflation, financial well-being.

EFFECTS OF ALTERNATIVE ECONOMIC SCENARIOS AND COMMODITY POLICIES ON REGIONAL REPRESENTATIVE FARMS

Aggregate analyses of the farm production sector have often provided a general overview of the national characteristics and economic wellbeing of farmers given various agricultural policies and general economic conditions. However, these aggregate analyses mask the diversity and heterogeneity of the micro units comprising the farm production sector, and consequently the distributional effects on income and equity of different types of farms (Bonnen; Lins and Duncan; Davenport, et al.)

Linking changing use of resources and finanacial wellbeing with changing farm organization is now and has been a topic debated at length in the literature. The evidence, or lack of it, has been primarily discussed in terms of the effects of commodity programs and the distribution of benefits:

> "The impact of price supports might well have been output-increasing, but whether or not the distribution of benefits favor large farms or are proportional to size has never, to our satisfaction been demonstrated" (Gardner, et al.)

> "research provides no compelling evidence that government commodity programs inhibited or accelerated farm consolidation and enlargement" (Tweeten)

Johnson and Clayton have recently argued that

> "it is through the inequality of incomes and access to resources that farm programs ultimately have their impact on organization within the farm sector, more specifically it is the interaction of farm programs operating at the farm level, the goals of the farm operator, and the tenure and equity position of the operator that cause organizational changes"

While, Rausser, and others contend that measurement of the relationships between policy, industry structure, and

> "the distributional effects of agricultural production policies can be examined seriously only through their indirect effect, but in order to assess the effects of alternative agricultural policies and economic conditions on the farm sector it will be necessary to develop conceptual frameworks and quantitative tools for analyzing participation and distributional questions at different levels of aggregation".

Not surprisingly, then, the linking of micro (farm level) and aggregate (sector or national) policy analyses is receiving renewed empirical emphasis and debate by economists (Baum, et al. (1982a), Boehlje and Griffin; Jensen, et al.). However, agricultural policy is but one set of behavioral constraints with which farmers interact. Technological, instutional and economic constraints together with local and federal regulations also affect farmers' behavior in organizing and acquiring control of production assets [Miller, et al.; Davenport, et al.; Lins and Duncan; Melichar; and Baum, et al. (1982b)].

The remaining sections of this paper will examine the effects of three alternative policy and economic environments on a set of regional representative farm situations for the period 1980 through 1986. Following Johnson and Clayton and Rausser, et al., it will be the position of the authors that an appreciation of the effects of economic policies affecting the farm sector entails probing behind national aggregate data for effects on individual farms.

THE REPRESENTATIVE FARMS

The representative farming situations portray operating characteristics and economic conditions from the viewpoint of the farm. These farming situations reflect a total enumeration of farming units within a selected area by size and commodities produced. The analytic methods used to stratify and identify representative farm data and operating characteristics were developed jointly by ERS and the Bureau of the Census. Detailed budgets were developed for each of these farms for 1980 from the 1978 Census of Agriculture and from data developed from ERS Cost of Production surveys. [1/] These budgets, operating characteristics, and changing economic conditions were then evaluated with a general farm level simulation-programing model, FLIPRIP, for the years 1980 to 1986. [2/] A brief description of the representative farms are:

- o The Illinois corn-soybean farm is located in the east-central area of the State. The landbase is comprised of 360 acres of cropland (180 acres each of corn and soybeans) and 20 acres of pasture/woodland/other.

- o The Mississippi cotton-soybean farm is located in the Delta. The landbase consists of 1,040 acres of cropland (480 acres of cotton and 560 acres of soybeans) and 240 acres of other land.

- o The Montana winter wheat farm on fallow is located in the north-central region. The landbase consists of 2,140 acres of cropland (960 acres of wheat, 960 acres of fallow and 220 acres of other land.

- o The Kansas winter wheat farm is located in the south-central area. The landbase consists of 480 acres of non-irrigated cropland (360 acres of wheat, 80 acres of alfalfa and 40 acres of grain sorghum) and 100 acres of pastureland/other. The enterprise also supports a beef livestock enterprise consisting of 15 beef cows and 30 stockers.

- o The Texas irrigated cotton farm is located in the High Plains. The landbase area consists of 780 acres, 680 of which are irrigated cotton cropland.

It is recognized that the economic well-being of farms is strongly influenced by tenure arrangements and the operator's equity level. The following three tenure and equity combinations were assessed for for each farm:

(1) Full equity owners;

(2) Part equity owners with 80-percent equity; and

(3) Part owners with part equity with 80 percent equity who rent 50 percent of the land they operate.

Economic and Policy Scenarios

In order to demonstrate the cumulative effect of alternative agricultural and financial policies and the general economic environment on these representative farming situations, each situation was analyzed from 1980 through 1986 under three combinations of policy and economic scenarios. Each economic scenario included specification of the inflation rate, various interest rates, yields, and patterns of input and product prices that family farms might face during this period and are partially described in table 1 and below:

BASELINE--In the baseline scenario, interest rates, commodity prices, and input costs from 1980 to 1986 were developed from data published in the Fall, 1981 ERS Baseline Databook, the 1982 Agricultural Finance Databook, and simulation results from FAPSIM, the current U.S. aggregate econometric forecasting model used in ERS. 3/ Observed average yields for the multi-county area were used for 1980 and 1981, and projected yields were used afterwards for each farm. An acreage reduction program (10 percent corn and sorghum and 15 percent wheat and cotton) was in effect in 1981 and 1982. All other commodity and economic programs were in effect as well through 1986, including the Economic Recovery Tax Act of 1981 (ERTA) and price support programs. Export quantities and other factors were held at trend levels.

Short term average annual interest rates were assumed to decline gradually from 17 percent to 10.6 percent by 1986. Long term rates followed a similar pattern. The beginning, intermediate, and long term interest rates in 1980 on debt were 7.8, 7.8, and 8.3 percent, respectively. The rate of inflation of the various farm input cost categories was assumed to average approximately 9 percent in 1982 and decline steadily to 7.5 percent in 1986.

In the baseline scenario, commodity and livestock prices followed dissimilar patterns. Yearly farm corn prices averaged $2.25/bu. in 1982 and 1983, then

Table 1. Economic and Policy Scenarios Used in the Representative Farm Analysis (1982/1986 values) 1/

Item	Baseline	Baseline w/reduced Inflation 7/	Baseline without Commodity Programs
General Economic Variables 2/			
Inflation Rate	9.0/6.9	4.5/3.5	9.0/6.9
Short Term Interst Rate	17.0/10.6	8.5/5.3	17.0/10.6
Interm Term Interest Rate	17.0/10.0	8.5/5.0	17.0/10.0
Long Term Interest Rate	16.6/8.1	8.4/4.1	16.6/8.1
Input Cost Inflation Rates			
New Machinery	9.7/8.5	4.9/4.3	9.7/8.5
Fertilizer and lime	11.5/8.6	11.5/8.6	11.5/8.6
Chemicals	9.8/7.5	4.9/3.8	9.8/7.5
Fuel and Lube	10.0/8.5	5.0/4.3	10.0/8.5
Farm Services Rent	8.2/6.8	4.1/3.4	8.2/6.8
Other Production Items	6.9/7.5	3.5/3.8	6.9/7.5
Target Prices per bu.			
Corn	2.55/2.95	2.55/2.95	0.0/0.0
Sorghum	2.60/3.18	2.60/3.18	0.0/0.0
Oats	1.31/1.59	1.31/1.59	0.0/0.0
Barley	2.60/2.85	2.60/2.85	0.0/0.0
Wheat	4.05/4.90	4.05/4.90	0.0/0.0
Cotton 4/	71.0/95.0	71.0/95.0	0.0/0.0
Soybeans 5/	5.25/5.25	5.25/5.25	0.0/0.0
Expected Average Annual Farm Prices per bu. 8/			
Corn	2.25/4.03	2.70/3.69	2.29/4.17
Sorghum	2.26/3.66	2.61/3.37	2.27/3.69
Oats	1.64/2.29	1.82/2.31	1.65/2.34
Barley	2.23/3.34	2.60/3.31	2.26/3.69
Wheat	3.22/5.33	3.95/4.80	3.15/4.96
Cotton 4/	*	*	*
Soybeans	5.71/9.36	6.05/8.94	5.52/9.53
Kansas City Choice Feeders 6/	69.44/100.95	69.06/86.92	68.85/92.22

1/ 1980-81 input indexes were taken from Agricultural Outlook publications AO-75 and AO-76, Economic Research Service, U.S. Dept. of Agriculture. 2/ Consistent inflation and interest rate expectations were derived form the Fall 1981 ERS Annual Baseline Databook used for internal purposes and from E. Melichar and P. Balides Agricultural Finance Databook, Division of Research and Statistics, Board of Governors of the Federal Reserve System, Washington, D.C., March 1982. Given the recent volatility of interest rates, relationships among various interest rates and these interest rates with the general rate of inflation have varied widely. Consequently, the relationships expressed here are the subjective views of the authors and are not official USDA projections. 3/ From Fall 1981 ERS Annual Baseline Databook used for internal purposes. 4/ The Federal Government is prohibited from publishing projected cotton price data. Target prices are in cents per lb. 5/ Loan rate. 6/ Dollars per cwt. 7/ It was assumed that the inflation and interest rates were approximately halved. 8/ In 1982 and 1983 these prices were estimated with FAPSIIM (see Salathe, et. al.) given set-aside acreages without diverion payments or 15 percent for wheat and cotton, and 10 percent for the feedgrains.

fell 10% in 1984 before gradually increasing. Other feedgrains followed a similar pattern. Wheat and soybean prices increased steadily to $5.32 and $8.77 per bushel, respectively. Cotton prices increased through 1984, and then fell gradually through 1986. Feeder cattle prices increased steadily.

BASELINE WITHOUT COMMODITY PROGRAMS--As above, but all Federal commodity programs were discontinued starting in 1982. When government programs were discontinued in 1982, the grain held in the Farmer Owned Reserve (FOR) was added to the total supply of grain to be sold in the year the FOR ended rather than the entire FOR entering the market during 1982. The 1981 ERTA provisions were in effect from 1981 through 1986. The same set of interest and inflation rates used in the baseline scenario were also used here.

The commodity and livestock annual price movements were slightly different in this scenario, although price patterns were similar. Annual average corn prices were a few cents higher in each year; wheat prices were about 5 percent lower each year; and soybean prices were about 5 percent higher each year. Annual average cotton prices were similar through 1983, were about 5 percent lower in 1984 and then remained about 5 percent less through 1986. The changes in feeder cattle prices paralleled those of cotton.

BASELINE WITH REDUCED INFLATION--To reflect reduced inflation, interest rates and changes in input costs were approximately halved from 1982 to 1986 from the baseline scenario. Other commodity and acreage reduction programs were in effect through 1986, as were the provisions of the 1981 ERTA.

Significant differences in both price movements and patterns were observed for commodity prices from 1982 through 1986. However, feeder cattle prices declined by about 10 percent relative to the baseline starting in 1984. Annual average corn and wheat prices were much stronger on average throughout this period, and exhibited less variance than in the baseline simulation. Soybean annual prices were significantly higher through 1985, but fell to the baseline level in

1986. Cotton prices increased 10 percent in 1982, were similar in 1983, fell 20 percent in 1983 and then increased noticeably in 1985 and 1986 to the levels in in the baseline scenario.

1981 Economic Recovery Tax Act

Simulations for the baseline scenario were also run with and without the provisions of the 1981 Economic Recovery Tax Act. The tax depreciation calculations for machinery purchased before 1981 assumed that it was depreciated using the double declining balance method in each set of simulations. In addition, additional first year accelerated depreciation was taken from 1981 to 1986. To reflect the 1981 ERTA, tax brackets and rates were changed starting in 1981 to reflect the ERTA provisions with the maximum tax rate of 50 percent on all income, and 5 percent, 10 percent, and 10 percent rate reductions in 1981, 1982, and 1983 respectively. Tax brackets were indexed beginning in 1985. The depreciation rates on machinery were also changed to reflect the specific changes from 1981 to 1984, 1985, 1986 and afterwards.

Values of Agricultural Assets

The value of agricultural assets was not directly linked to the inflation rate. The inflation rates for cropland in 1980 and 1981 are specified with observed data. From 1982 through 1986, the appreciation rate for cropland was determined using a weighted moving average of endogenously estimated nominal returns to production assets in the two previous years. Thus, as the farm enterprises became more profitable in different environments, the value of the landbase (and adjusted net worth) would appreciate more rapidly. Thus, this analysis does not consider the potential effects of inflation hedging, growth stock motives, or tax sheltering on the growth in value of farm assets.

SIMULATION RESULTS

In general, simulations yielded consistent findings: that full owners with full equity are in the strongest economic positions, full owners with 80 percent equity are in the next strongest position, and part-owners

with 80 percent equity are in the weakest economic positions. Other studies have occasionally found the economic positions of the latter two categories reversed for some tenure equity combinations (Jensen, et al.). The relative position of part owners and full owners with partial equity depends on the relative cost of servicing debts on debt-encumbered land versus the cost of cash or share rent on unowned land. In general, annual debt service costs per acre exceed rental costs per acre, thus partial ownership (of a given percentage) tends to increase a farm's current net cash income but decrease its deferred capital appreciation income; whereas partial equity (of the same percentage) tends to decrease a farm's current net cash income but increase its deferred capital appreciation income.

In interpreting these simulations, it is important to note that relatively high equity percentages (80 percent) were assumed among farms with partial equity. The assumed debt to asset ratio of 20 percent is approximately the average of all farms with over $100,000 in sales in 1980. Thus, roughly half the farms will have less favorable equity positions and roughly half will have more favorable equity positions.

A second caveat in interpreting the results of these simulations is that they are projections of general tendencies, not forecasts of specific conditions. They should be interpreted as indicating under which sets of conditions farms will have improved economic wellbeing--but not taken as firm forecasts of whether specific farms will be profitable. 4/

Ending Net Worth.--Under the baseline scenario (normal expected yields and prices), both the full owners with full equity and the full owners with partial equity are able to increase their nominal net worths by 1986. Part owners, in general, are not able to increase their nominal net worths (Table 2). The Kansas typical farm is an exception to the above; under the baseline scenario it is not able to increase its nominal net worth under any of the tenure and equity combinations. The Montana typical farm faces nearly as uncertain

conditions. Both of these reflect the greater price and yield risks faced by single crop farms in the Great Plains.

The ending net worths of farms in real 1980 dollars show a different story (Table 3). All farms and all tenure and equity combinations show declining real net worths. This illustrates the effects of the cash flow squeezes that accompany inflation. However, remember that the values of farm assets in these simulations do not include the inflation-hedging, growth-stock, or tax sheltering motives--each of which would tend to increase nominal values of assets and tend to offset the erosion of real net worth.

Under the reduced inflation scenario, all farms fared much better. All farms at all tenure and equity combinations, except the Kansas farm, were able to increase their nominal worths. In real 1980 dollars, the full owners were able to maintain the value of their net worths, and part-owners full owners with partial equity suffered declines of approximately half of what would have occurred under continued inflation.

In the policy environment without commodity programs, all farms fared significantly worse--from 10 to 21 percent worse for full owners, from 11 to 29 percent worse for full owners with partial equity, and from 15 to 33 percent worse part for part owners (Table 3). The more severe changes occurred on wheat and cotton farms, indicating that commodity programs are relatively more important to these crops than to corn or soybeans. Also, they indicate that commodity programs are relatively more important to farms in the South and the Great Plains.

Net Cash Farm Income.--Annual net cash farm incomes (before deduction for depreciation, taxes, debt repayment, or family living needs) were in the $50,000 to $60,000 range for full owners with full equity in Illinois, Mississippi, and Texas. The Kansas and Montana farms were in the $25,000 to $30,000 range under

the baseline scenario (Table 4). The net cash incomes of full owners with partial equity were approximately half as much as those of full owners with full equity--indicating that with current interest rates farms with 20 percent debt face a fairly severe cash flow problem. The part owner farms in Illinois, Mississippi and Texas had net cash incomes in the $15,000 to $20,000 range. The Kansas and Montana farms showed net cash losses--severe for the Kansas farm and moderate for the Montana farm.

With the reduced inflation scenario all farms had improved net cash farm incomes: to the $30,000 to $90,000 range for full owners with full equity (up 20 to 50 percent), to the $15,000 to $66,000 range for full owners with partial equity (up 56 to 175 percent), and to the $7,000 to $50,000 range for part owners (up 55 to 320 percent). Full owners receive the largest absolute increases in income from reduced inflation; part owners received the largest percentage increases in income.

In the policy environment without commodity programs, all farms had reduced net cash incomes--off 12 to 39 percent for full owners with full equity, off 33 to 258 percent (indicating a net cash loss) for full owners with partial equity and off 24 to 450 percent for part owner farms. The Mississippi cotton-soybean farm and the Montana wheat farm would be most seriously affected if commodity programs were suspended; the Illinois corn-soybean farm and the Texas irrigated cotton farm have their net cash farm incomes affected least by commodity programs.

Probability of Survival.--The probability of full owner farms remaining solvent (greater than 35 percent equity) through 1986 over 50 iterations was essentially 100 percent in all cases except the Kansas Farm (Table 5). From the baseline scenario to the reduced inflation scenarios, the Kansas farm's probability of survival increased by ten or more percentage points. The relative financial strengths of full ownership equity farms vs full owner part

Table 2. Average Ending Net Worth in 1986 of Various Farm Situations Under Alternative Policy and Economic Environments

Farming Situations	Beginning Net Worth (Market Value)	Ending Net Worth with Commodity Programs and the 1981 ERTA Provisions	Ending Net Worth with Reduced Inflation	Percentage Change from Baseline	Ending Net Worth without any Commodity Programs	Percentage Change from Baseline
			Dollars			
Full Owner-Full Equity:						
Illinois	1,110,213	1,575,542	1,714,368	8.8	1,413,990	-10.3
Mississippi	1,269,530	1,760,048	2,018,909	14.7	1,520,299	-13.6
Texas	758,926	1,322,869	1,539,514	16.4	1,048,278	-20.8
Kansas	546,107	444,812	463,297	4.2	357,596	-19.6
Montana	832,410	994,889	1,065,674	7.1	878,178	-11.7
Full Owner-Part Equity:						
Illinois	890,131	1,054,809	1,149,293	9.0	934,066	-11.4
Mississippi	1,038,841	1,300,960	1,514,730	16.4	1,075,466	-17.3
Texas	614,130	906,319	1,057,798	16.7	645,319	-28.8
Kansas	443,559	242,495	254,981	3.0	201,077	-17.1
Montana	674,558	691,513	731,064	5.7	562,157	-18.7
Part Owner-Part Equity:						
Illinois	531,805	544,497	614,420	12.8	462,524	-15.1
Mississippi	706,041	681,723	872,053	27.9	473,814	-30.5
Texas	405,072	406,672	522,900	28.6	271,670	-33.2
Kansas	291,376	*	161,225	NA	*	NA
Montana	437,451	276,275	311,350	12.7	187,074	-32.3

* Not representative, farms remained solvent in fewer than 10 percent of the simulations.

NA = Not Applicable.

Table 3. Average Ending Net Worth in 1986 of Various Farm Situations in Alternative Economic Environments (in Real 1980 dollars)

Farming Situations	Beginning Net Worth (Market Value)	Ending Net Worth with Commodity Programs and the 1981 ERTA	Percent change from Beginning Value	Ending Net Worth with Reduced Inflation	Percentage Change from Baseline	Ending Net Worth without any Commodity Programs	Percentage Change from Baseline
				Dollars			
Full Equity Owner:							
Illinois	1,110,213	768,182	-30.8	1,053,051	+37.1	689,415	-10.3
Mississippi	1,269,530	858,141	-32.4	1,240,116	+44.5	741,248	-13.6
Texas	758,926	644,987	-15.0	945,647	+46.6	511,106	-20.8
Kansas	546,107	216,876	-60.3	284,580	+31.2	174,352	-11.7
Montana	832,410	485,075	-41.7	654,591	+34.9	428,171	-11.7
Part Equity Owner:							
Illinois	890,131	514,290	-42.2	705,954	+37.3	455,419	-11.4
Mississippi	1,038,841	634,305	-38.9	930,423	+46.7	524,362	-17.3
Texas	614,130	441,891	-28.0	649,753	+47.0	314,636	-28.8
Kansas	443,559	118,232	-73.3	156,622	+32.4	98,039	-17.1
Montana	674,558	337,158	-50.0	449,057	+33.2	274,089	-18.7
Tenant Part Equity Owner:							
Illinois	531,805	265,479	-50.1	377,408	+42.2	225,511	-15.1
Mississippi	706,041	332,386	-52.9	535,659	+61.2	231,016	-30.5
Texas	405,072	198,280	-51.1	321,192	+62.0	132,457	-33.2
Kansas	291,376	*	NA	99,032	NA	*	NA
Montana	437,451	134,703	-69.2	191,247	+42.0	91,211	-32.3

* Not representative, farms remained solvent in fewer than 10 percent of the simulations.

NA = Not Applicable.

Table 4. Average Yearly Net Cash Farm Income Under Alternative Policy and Economic Environments From 1982 to 1986

Farming Situations	Average Net Income with Commodity Programs and the 1981 ERTA Provisions	Average Net Income with Reduced Inflation	Percentage Change from Baseline	Average Net Income without any Commodity Programs	Percentage Change from Baseline
			Dollars		
Full Owner-Full Equity:					
Illinois	47,823	63,519	32.8	37,592	-21.4
Mississippi	60,600	96,454	59.2	36,992	-39.0
Texas	52,544	72,346	37.7	43,781	-16.7
Kansas	25,048	30,042	19.9	22,125	-11.7
Montana	30,009	40,993	36.6	21,724	-27.6
Full Owner-Part Equity:					
Illinois	25,110	39,385	56.7	16,664	-33.6
Mississippi	29,930	66,489	122.1	-1,723	-105.8
Texas	28,506	48,863	71.4	14,939	-47.6
Kansas	9,016	15,175	68.3	4,098	-54.5
Montana	5,431	14,935	175.0	-8,597	-258.3
Part Owner-Part Equity:					
Illinois	21,960	33,905	54.4	12,277	-44.1
Mississippi	15,351	51,882	228.0	-18,827	-222.6
Texas	15,653	36,412	132.6	11,846	-24.3
Kansas	*	6,460	NA	*	NA
Montana	-3,447	7,641	221.7	-18,963	-450.1

* Not representative, farms remained solvent in fewer than 10 percent of the simulations.

NA = Not Applicable.

owner farms is shown by the declining probability of survival of the Kansas farm. In the policy environment without commodity programs, the Mississippi, Texas, and Montana part owner farms also have probabilities of survival that are less than 100 percent. These simulations assume distributions around trend yields and trend prices for the years 1982 through 1986. Thus, if actual yields of 1982 crops are depressed in any area (as occurred in the Texas High Plains) then the probability of that farm surviving until 1986 would be significantly reduced, unless higher compensatory income(s) were to occur in a following year(s).

Farm Growth.--The potential for farm growth is measured by purchases of farmland the typical farms were able to make between 1980 and 1986 (Table 6). Only the Texas full owner farms with full equity were able to expand their land base. In the baseline scenario, the Kansas farm had to sell some land to remain solvent in the full owner-part equity situation and in the part owner situation.

Reducing inflation allowed the Illinois, Texas, Kansas, and Montana farms to expand their acreage by small amounts--less than ten percent. Full owner farms with partial equity and part owner farms were unable to expand and the Kansas farm still had to sell land in order to remain solvent. If commodity programs were suspended the Texas and Kansas farms would have to sell land to remain solvent, regardless of their beginning tenure equity situations.

Ending Equity to Asset Ratio.--The final measure of financial strength is the equity to asset ratio for the farms in 1986. The full owners with full equity started the simulations with an equity/asset ratio of 1.0; other farms were started with equity/asset ratios of .80, approximately equal to the average of farms with over $100,000 in sales in 1980 (Table 7).

Table 5. Percent Probability of Farm Survival under Alternative Policy and Economic Environments

Farming Situations	Baseline Probability with Commodity Programs and the 1981 ERTA Provisions	Probability with Reduced Inflation	Percent Change from Baseline	Probability without any Commodity Programs	Percent Change from Baseline
			Dollars		
Full Owner-Full Equity:					
Illinois	100	100	0.0	100	0.0
Mississippi	100	100	0.0	100	0.0
Texas	100	100	0.0	100	0.0
Kansas	68	76	11.8	62	-6.8
Montana	100	100	0.0	100	0.0
Full Owner-Part Equity:					
Illinois	100	100	0.0	100	0.0
Mississippi	100	100	0.0	100	0.0
Texas	100	100	0.0	100	0.0
Kansas	34	50	47.0	28	-17.6
Montana	100	100	0.0	100	0.0
Part Owner-Part Equity:					
Illinois	100	100	0.0	100	0.0
Mississippi	100	100	0.0	94	-6.0
Texas	98	100	2.0	70	-30.0
Kansas	*	26	NA	*	NA
Montana	100	100	0.0	90	-10.0

* Not representative, farms remained solvent in fewer than 10 percent of the simulations.

NA = Not Applicable.

Table 6. Average Total Owned Cropland Acreage in Final Year under Alternative Policy and Economic Environments for Solvent Solutions

Farming Situations	Beginning Owned Acreage	Baseline Acreage with Commodity Programs and the 1981 ERTA Provisions	Acreage with Reduced Inflation	Percent Change from Baseline	Acreage without any Commodity Programs	Percent Change from Baseline
Full Owner-Full Equity:						
Illinois	360	360	398	10.6	360	0.0
Mississippi	1,040	1,040	1,040	0.0	1,040	0.0
Texas	680	741	815	10.0	680	-8.2
Kansas	500	500	515	3.0	472	-5.6
Montana	1,920	1,929	1,965	1.9	1,920	0.0
Full Owner-Part Equity:						
Illinois	360	360	360	0.0	360	0.0
Mississippi	1,040	1,040	1,040	0.0	1,040	0.0
Texas	680	680	680	0.0	668	-1.8
Kansas	500	476	451	-5.3	370	-22.3
Montana	1,920	1,920	1,923	0.2	1,920	0.0
Part Owner-Part Equity:						
Illinois	180	180	180	0.0	180	0.0
Mississippi	520	520	520	0.0	520	0.0
Texas	340	340	340	0.0	312	-8.2
Kansas	250	*	211	NA	*	NA
Montana	960	960	960	0.0	960	0.0

* Not representative, farms remained solvent in fewer than 10 percent of the simulations.

NA = Not Applicable.

Table 7. Average Equity to Asset Ratio in Final Year under Alternative Policy and Economic Environments

Farming Situations	Beginning Equity to Asset Ratio	Final Ratio with Commodity Programs and the 1981 ERTA Provisions	Final Ratio with Reduced Inflation	Percent Change from Baseline	Final Ratio without any Commodity Programs	Percent Change from Baseline
Full Owner-Full Equity:						
Illinois	1.00	.871	.807	-7.3	.865	-0.7
Mississippi	1.00	.824	.840	1.9	.800	-2.9
Texas	1.00	.805	.790	-1.9	.810	0.1
Kansas	1.00	.674	.706	4.7	.674	0.0
Montana	1.00	.803	.814	1.4	.786	-2.1
Full Owner-Part Equity:						
Illinois	.80	.717	.728	1.5	.694	-3.2
Mississippi	.80	.688	.728	5.8	.620	-9.9
Texas	.80	.692	.741	7.1	.589	-14.9
Kansas	.80	.471	.506	7.4	.483	2.5
Montana	.80	.629	.629	0.0	.567	-9.9
Part Owner-Part Equity:						
Illinois	.80	.644	.669	3.9	.598	-7.1
Mississippi	.80	.579	.646	11.6	.488	-15.7
Texas	.80	.547	.635	16.1	.432	-20.1
Kansas	.80	*	.400	NA	*	NA
Montana	.80	.478	.495	3.6	.501	4.8

* Not representative, farms remained solvent in fewer than 10 percent of the simulations.

NA = Not Applicable.

All farms experienced a decline in their equity/asset ratios for all tenure and equity combinations. Full owner farms with 100 percent equity initially declined to equity/asset ratios in the low 80's--still implying quite strong financial health. These farms can expect slightly positive annual net cash farm incomes in most years, and are in a position to expand when a good year comes along.

Full owners who started with eighty percent equity saw their equity percentages decline to 60 to 70 percent, implying these farms will face negative net cashflows perhaps as many as one year in two, but in general, the capital appreciation of their assets will allow them to increase their net worths over time. Part owners who started the simulations with eighty percent equity have their equity to asset ratios decline to the 40's to 50's range. These farms will face negative net farm incomes in most years, have very little borrowing reserves, and can be forced into liquidation by a single unfavorable year. In the baseline scenario, two thirds of the farm situations have ending equity asset ratios below 70 percent--generally those specified initially with either part ownership or part equity. With the reduced inflation scenario, seven farm situations have ending debt to asset ratios below 70 percent--the part owners, and the Kansas and Montana full owners with partial equity. Without commodity programs, eleven farm situations have ending equity to asset ratios below 70 percent--five of them below 50 percent. In summary, controling inflation would likely strengthen the financial health of these farms. Suspension of commodity programs would noticeably increase financial stress, especially of the part owner and part equity farms.

SUMMARY

Simulations of representative farms for five production regions (Corn Belt, Texas High Plains, Mississippi Delta, Southern Plains, and Northern Plains) showed the impacts of inflationary conditions, government commodity programs, and the Economic Recovery Tax Act of 1981 on representative crop farms through 1986. For this period, fully owned farms with no debt are

likely increase their nominal net worths, be able to maintain minimal family living allowances, and replace some of their depreciable capital. However, they will likely suffer some erosion of the real value of their net worths due to inflation. Fully owned farms with modest debt/asset ratios face nearly the same prospects. However, part-owner part-renter farms face the prospects of not being able to increase their net worths in the 1980 to 1986 period with baseline conditions. They face very restricted net cash farm income situations--even to the point of net cash losses, and inability to replace any machinery or depreciable capital.

If the expected rate of inflation in the baseline scenario were cut in half, through macro policy conditions, all farms would fare significantly better, and the fully-owned debt-free farm could maintain the real 1980 value of its net worth. Fully owned farms with modest debts could increase the nominal value of their net worths and prevent serious erosion of their real net worths. Part owner-part renter farms could maintain the nominal value of their net worths, but not their real values. Recall however, that this analysis does not consider the potential increase in asset values tht result from inflation hedging, growth-stock, or tax-shelter motives that might accompany future inflation in the general economy.

If commodity programs were suspended all farms would fare significantly worse than in the baseline scenario--full owners without debt would have their ending net worths reduced by 10 to 20 percent, part owners would have their ending net worths reduced by 15 to 30 percent and full owners with debt would be in an intermediate position. The Economic Recovery Tax Act of 1981 (ERTA) would make little difference in the performance of these representative farms in the 1981 to 1986 period, because the expected taxable incomes of these farms would be very low.

In general, this study responds to the lack of empirical studies noted in the statements of Gardner and Tweeten, and these results support the arguments of Johnson and Clayton, and Rausser, et al. Commodity programs have been shown to have salutary effects on capital accumulation, net cash farm incomes, and probability of survival of representative farms. Finally, inflation and macroeconomic policies have been shown to strongly influence these same performance variables when considering only the agricultural production value of assets.

1/ See Hatch, et al. for a description of the development of representative farm situations. A complete lising of the representative farm operating charcteristics, such as the financial structure and make-up of the machinery complement is available upon request from the authors.

2/ See Baum, Richardson and Schertz for a more detailed explanation of FLIPRIP, the farm level analysis income and policy simulation--programming model used in this analysis.

3/ See Salathe, et al. more detailed explanation of FAPSIM, the aggregate food and agriculture policy model used to estimate the national prices used as exogenous information for the farm simulations. The farm level or micromodel, FLIPRIP, used in this analysis uses national prices projected by FAPSIM for crop and livestock activities as expected trend prices. These trend prices are then regionalized by FLIPRIP, as are loan and target prices.

4/ The operating characteristics for each representative farm reflect modal characteristics for each specific region. Particular individual farm operators (and families) would exhibit different production and marketing efficiencies or planning strategies, age distribution, machinery mix, consumption patterns, etc. than those characteristics used in this study. Consequently, the result for a particular farm situation is expected to be similar, but different from a representative group (or class) of farms.

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